



# **A BETTER UNDERSTANDING AND ACCOUNTING OF TOTAL WILDFIRE COSTS**

**Wildland Fire Canada 2012: Managing Fire in Changing  
Times**

**Kananaskis, Alberta**

**October 2-4, 2012**

**Robert W. Gray**

**Fire Ecologist, R.W. Gray Consulting, Ltd.**

***“Dramatic Rise in forest fires projected for  
Canada’s west due to warming”*** Globe and Mail, February  
19, 2012



Blazes to be five or  
six times more  
frequent, and more  
intense, due to  
climate change — Mike  
Flannigan at American  
Association for the  
Advancement of Science.



## ***Climate Change to Bring More and Severe Wildfires to BC: Report*** Vancouver Sun, June 8, 2012

- **Number of major fires in BC likely to increase by >50% in next 40 years,**
- **Warmer temperatures,**
- **Declining and disappearing mountain snowpacks,**
- **Drier summers,**
- **More intense rainfall**

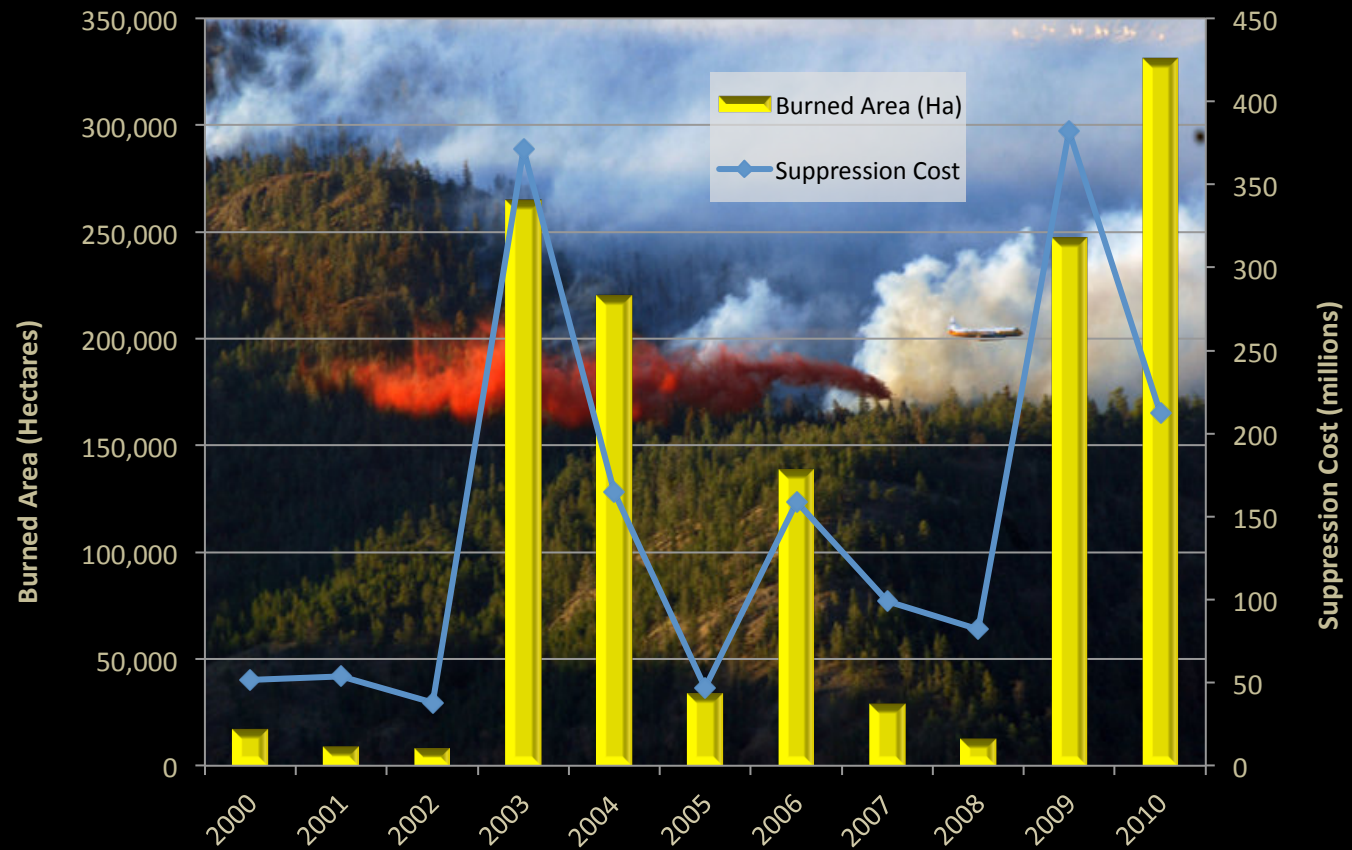
IBC  BAC | Insurance Bureau of Canada  
Bureau d'assurance du Canada

### **TELLING THE WEATHER STORY**

PREPARED BY  
THE INSTITUTE FOR CATASTROPHIC LOSS REDUCTION (ICLR)  
FOR INSURANCE BUREAU OF CANADA (IBC)

June 2012

# Impacts on the Treasury/ Taxpayers



Source: Ministry of Forests, Lands and Natural Resource Operations, Wildfire Management Branch

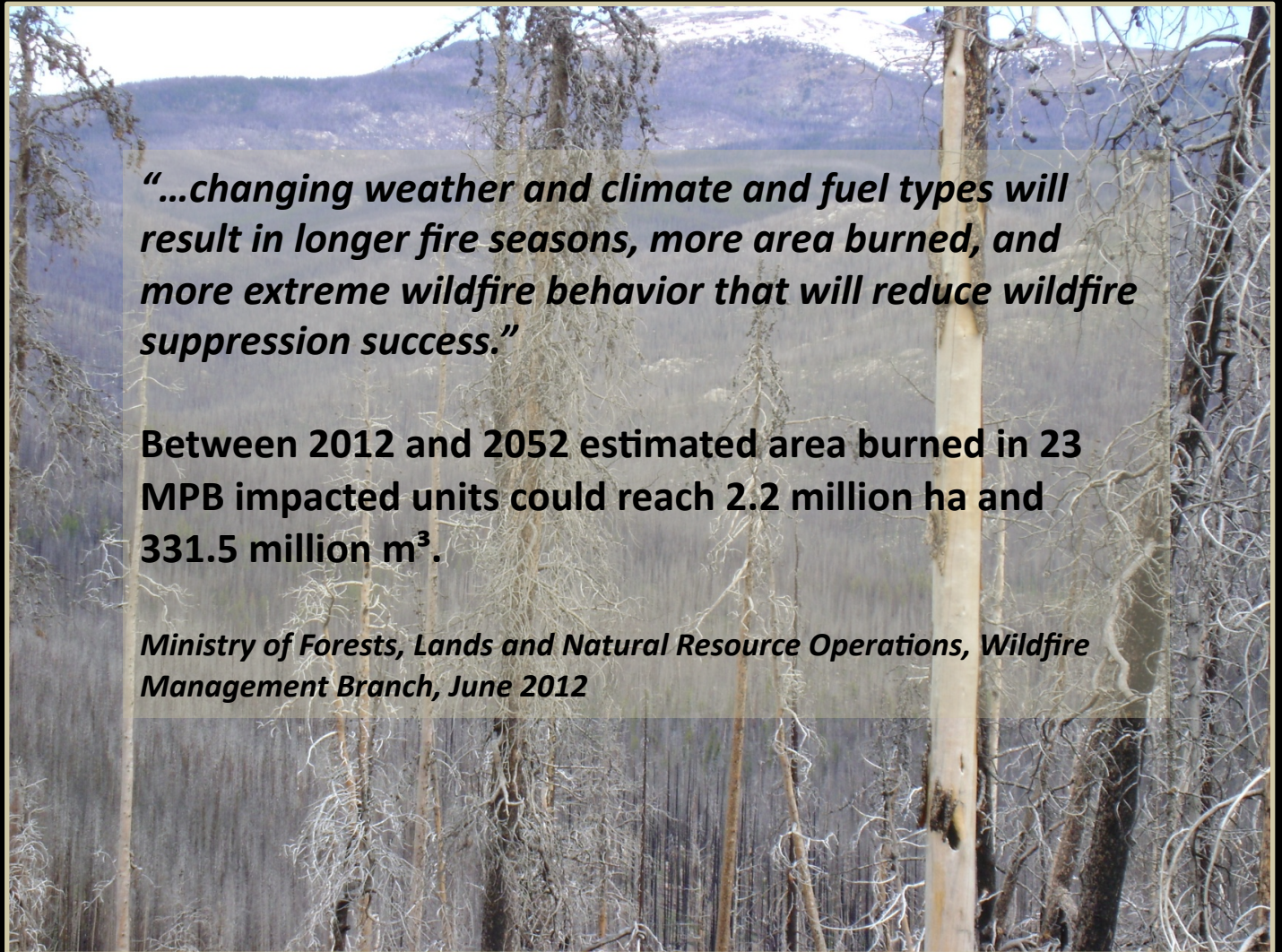
# Potential Wildfire Impacts on Midterm Timber supply



*“...changing weather and climate and fuel types will result in longer fire seasons, more area burned, and more extreme wildfire behavior that will reduce wildfire suppression success.”*

**Between 2012 and 2052 estimated area burned in 23 MPB impacted units could reach 2.2 million ha and 331.5 million m<sup>3</sup>.**

*Ministry of Forests, Lands and Natural Resource Operations, Wildfire Management Branch, June 2012*





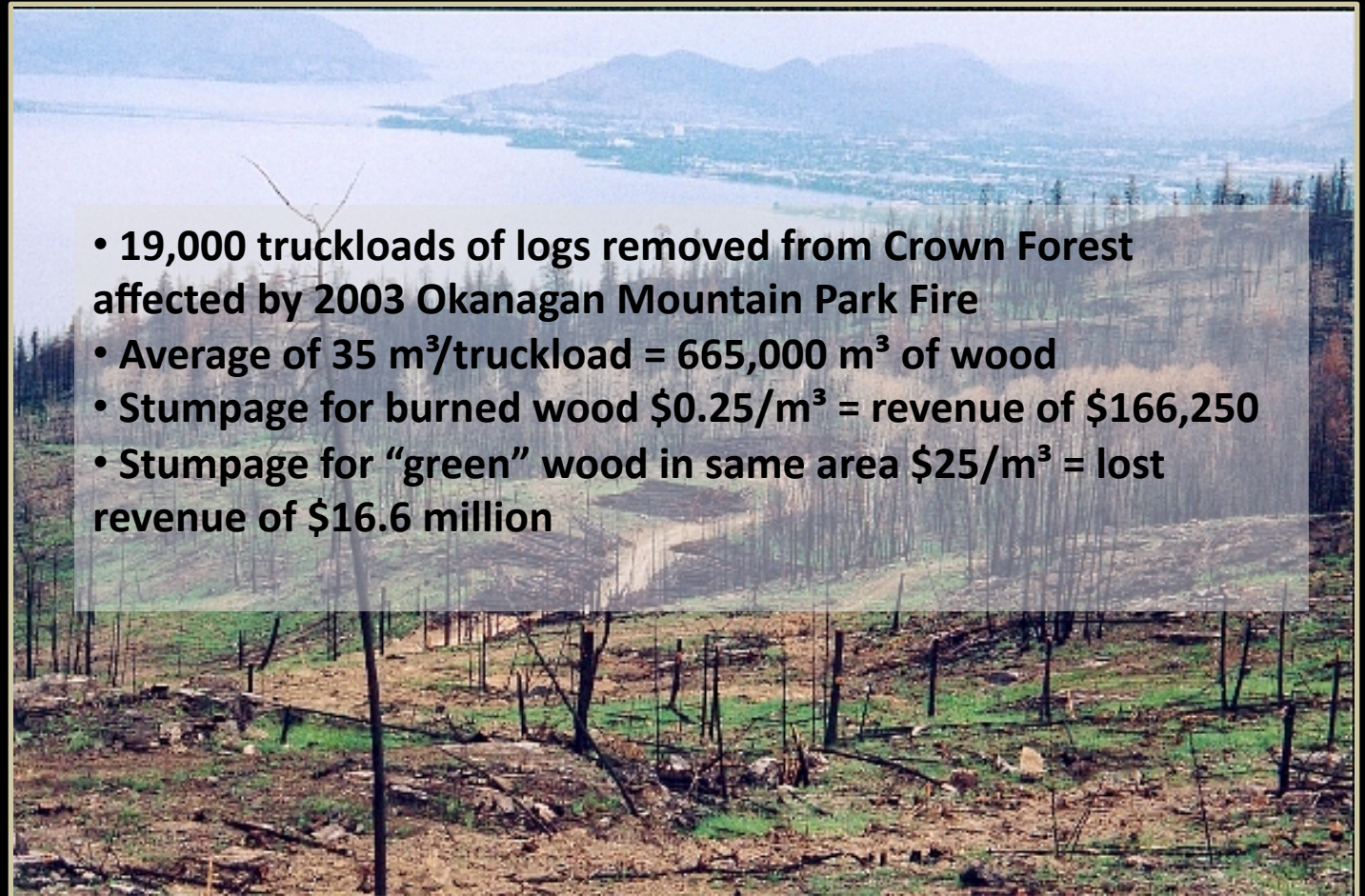
***While we often have a full or basically “good” accounting of suppression costs we rarely have a good accounting of “total” costs***

## Example: Impacts on the Tourism Industry

**In 2003 the economic cost to the famous Okanagan tourism industry was estimated at \$80 million.**



## Example: Fire Impact on resources and the local economy (in this case provincial stumpage revenue)



- 19,000 truckloads of logs removed from Crown Forest affected by 2003 Okanagan Mountain Park Fire
- Average of 35 m<sup>3</sup>/truckload = 665,000 m<sup>3</sup> of wood
- Stumpage for burned wood \$0.25/m<sup>3</sup> = revenue of \$166,250
- Stumpage for “green” wood in same area \$25/m<sup>3</sup> = lost revenue of \$16.6 million





## Example: 2001 Chisholm Fire in Alberta – sometimes we have a good partial picture

- 116,000 ha
- ***Health effects estimated at between \$9 and \$12 million (95% of impacts related to increased mortality risk, restricted activity days, lost wages, acute respiratory symptoms),***
- \$2 million in bridge infrastructure,
- 75 buildings, including 21 homes lost, however their value was not assessed,
- \$1 million lost electrical power,
- \$20 million in lost timber value,
  
- **Suppression cost was \$10 million while extra costs exceeded \$33.5 million**



# What does a fuller accounting include?

- Considers long-term and complex costs, including:
  - Impacts to watersheds, ecosystems, infrastructure, businesses, individuals, and the local, provincial, and national economy,
  - These costs include: property losses (insured and uninsured), post-fire impacts (such as flooding, erosion, and water quality), air quality damages, healthcare costs, injuries and fatalities, lost revenue (to residents evacuated by the fire, and to local businesses), infrastructure shutdowns (such as highways, airports, railroads), and a host of ecosystem service costs that may extend into the distant future.
- Can be broken down into two analytic categories:
  - Direct and rehabilitation costs (fairly immediate),
  - Indirect and additional costs (longer-term costs that evade quantification).

*Source: The true cost of wildfire in the western U.S. Western Forestry Leadership Coalition, 2009.*

# Direct Costs



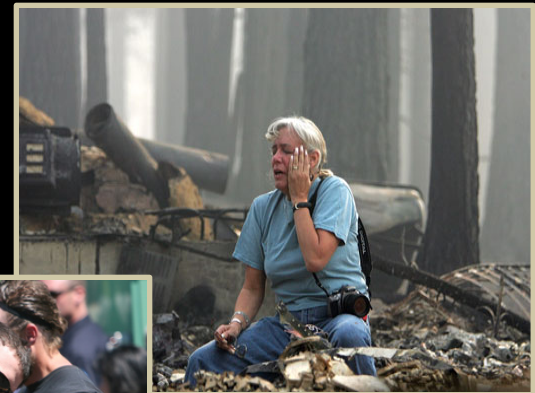
# Rehabilitation Costs



# Indirect and Additional Costs



**Long-term human health**



**Emotional problems**



**Firefighter fatalities**



**Ecosystem services**



**Property values**

# 2000 Cerro Grande Fire in New Mexico

- Escaped prescribed fire that eventually burned over 17,000 ha and significantly impacted the town of Los Alamos and the Los Alamos National Laboratory



Estimates of all direct, rehabilitation, indirect, and additional costs exceeded **\$907 million**

Suppression cost accounted for **3% of the total**



# 2002 Rodeo-Chediski Fire in Arizona

**Wildfire burned over 170,000 ha; the majority on the Fort Apache Indian Reservation**

**Suppression cost estimated at between \$43 and \$50 million**

**Other direct costs plus rehabilitation costs estimated at \$261.5 million**



**Indirect costs estimated at \$8.1 million but likely under-estimated. Job losses due to the loss of timber for 2 Tribal mills will extend over several generations**



# 2002 Hayman Fire in Colorado

**Wildfire burned over 55,000 ha in the Colorado Front Range south of Denver**

**Total direct costs, including suppression costs, property losses, and USFS facility and resource losses were \$139.5 million**

**Rehabilitation, impact, and special costs exceeded \$75 million at the end of 2003**

**Denver Water Board has continued to fund erosion control and water quality treatment at a cost of >\$20 million since 2003**





# 2003 Old, Grand Prix, and Padua Complex Fires in California

**Complex of wildfires burned over 50,000 ha's and forced the evacuation of over 100,000 residents**

**Property owners filed claims for 787 total losses and 3,860 partial losses**



**Suppression cost estimated at \$50 million**

**Estimated "true" cost of the fire complex is over \$1.2 billion; much of this is attributed to post-fire recovery and water mitigation expenditures**





***Why is it important to have a better accounting of “total fire cost”***

***If elected officials knew the total cost or “true” cost of wildfires they might be more willing to invest in preventative measures***